

Express Mail No.: EL 451 596 438 US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of: Yumin Liu

Serial No.: To be assigned

Group Art Unit: 1764

Filed: herewith

Examiner: Nguyen, T.

For: PROCESSES FOR OXIDATIVE  
DEHYDROGENATION

Attorney Docket No.: 10460-013-999

INFORMATION DISCLOSURE STATEMENT

Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

In accordance with the duty of disclosure provisions of 37 C.F.R. §1.56, there is hereby provided certain information which the Examiner may consider material to the examination of the subject U.S. patent application. It is requested that the Examiner make this information of record if it is deemed material to the examination of the application.

1. Enclosures accompanying this Information Disclosure Statement are:

- 1a. ☒ Form PTO-1449.
  - 1b. ☐ Copies of publications.
  - 1c. ☐ An English language copy of search report(s) from a counterpart foreign application or PCT International Search Report.
  - 1d. ☐ Explanations of relevancy (ATTACHMENT 1(d), hereto) or English language abstracts of the non-English language publications.
2. ☐ This Information Disclosure Statement is filed under 37 C.F.R. §1.97(b) before the latter of three months after the U.S. patent application filing date or the first Office Action on the merits. Accordingly, no fee or certification is required.
3. ☐ This Information Disclosure Statement is filed under 37 C.F.R. §1.97(c) after the first Office Action on the merits, but before a Final Office Action or a Notice of Allowance.

*(Check either Item 3a or 3b)*

- 3a. ☐ The Certification Statement in Item 5 below is applicable. Accordingly, no fee is required.

- 3b. ☐ The \$180.00 fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c) is:  
☐ enclosed  
☐ to be charged to Pennie & Edmonds LLP Deposit Account No. 16-1150.

*(Item 3b to be checked if any reference known for more than 3 months)*

4. ☐ This Information Disclosure Statement is filed under 37 C.F.R. §1.97(d) after Final Office Action or Notice of Allowance, but before payment of Issue Fee.

A Petition to the Commissioner is hereby made under 37 C.F.R. §1.97(d) to request consideration of this Information Disclosure Statement. The \$180.00 fee set forth in 37 C.F.R. §1.17(i)(1) is:

- ☐ enclosed.  
☐ to be charged to Pennie & Edmonds LLP Deposit Account No. 16-1150.

The Certification Statement in Item 5 below is applicable.

5. ☐ Certification Statement *(applicable if Item 3a or Item 4 is checked)*

*(Check either Item 5a or 5b)*

- 5a. ☐ In accordance with 37 C.F.R. §1.97(e)(1), it is certified that each item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Information Disclosure Statement.
- 5b. ☐ In accordance with 37 C.F.R. §1.97(e)(2), it is certified that no item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application or, to the knowledge of the undersigned after making reasonable inquiry, was known by any individual designated in 37 C.F.R. §1.56(c) more than three months prior to the filing of this Information Disclosure Statement.
6. ☒ A continuation application under 37 C.F.R. §1.60 or §1.53(b) or (d) is concurrently filed herewith.

*(Check appropriate Items 6a, 6b and/or 6c)*

- 6a. ☐ A Petition to Withdraw from issue under 37 C.F.R. §1.313(b)(5) is concurrently filed herewith.
- 6b. ☒ Copies of the publications listed on Form PTO-1449 from prior application Serial No. 09/255,371, filed on February 22, 1999, of which this application claims priority under 35 U.S.C. §120, have been omitted pursuant to 37 C.F.R. §1.98(d).
- 6c. ☐ Copies of the publications listed on Form PTO-1449 which were not previously cited in prior application Serial No. , filed on , of which this application claims priority under 35 U.S.C. §120, are provided herewith.
7. ☐ This is a Supplemental Information Disclosure Statement. *(Check either Item 7a or 7b)*

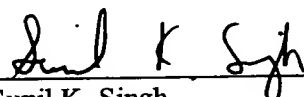
- 7a. ☐ This Supplemental Information Disclosure Statement under 37 C.F.R. §1.97(f) supplements the Information Disclosure Statement filed on \_\_\_\_\_. A bona fide attempt was made to comply with 37 C.F.R. §1.98, but inadvertent omissions were made. These omissions have been corrected herein. Accordingly, additional time is requested so that this Supplemental Information Disclosure Statement can be considered as if properly filed on \_\_\_\_\_.
- 7b. ☐ This Supplemental Information Disclosure Statement is timely filed within one (1) month of a PTO Notice under 37 C.F.R. §1.97(i).
8. ☐ In accordance with 37 C.F.R. §1.98, a concise explanation of what is presently understood to be the relevance of each non-English language publication is:

*( Check Item 8a, 8b, or 8c)*

- 8a. ☐ satisfied because all non-English language publications were cited on the enclosed English language copy of the PCT International Search Report or the search report from a counterpart foreign application indicating the degree of relevance found by the foreign office.
- 8b. ☐ set forth in the application.
- 8c. ☐ enclosed as an attachment hereto.
9. ☒ The Commissioner is authorized to charge any additional fee required or credit any overpayment for this Information Disclosure Statement and/or Petition to Pennie & Edmonds LLP Deposit Account No. 16-1150.
10. ☒ No admission is made that the information cited in this Statement is, or is considered to be, material to patentability nor a representation that a search has been made (other than a search report of a foreign counterpart application or PCT International Search Report if submitted herewith). 37 C.F.R. §§1.97(g) and (h).

Respectfully submitted,

Date March 22, 2001

  
Sunil K. Singh

45,298  
(Reg. No.)

For Samuel B. Abrams (Reg. No. 30,605)  
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FORM PTO-1449 U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE  Supplemental Information Disclosure Statement by Applicant  (Use several sheets if necessary)	ATTY. DOCKET NO. 99-3	SERIAL NO. 09/255,371
	APPLICANT Yumin Liu	
	FILING DATE 2/22/99	GROUP 1764

## U.S. PATENT DOCUMENTS

Exmr Initial	Document Number	Date	Name	Class	Sub Class	Filing Date
	3,678,124	7/18/72	Stepanov et al.	260	680 E	
	4,115,441	9/19/78	Shaw et al.	562	534	
	4,283,307	8/11/81	Barone et al.	252	432	
	4,709,071	11/24/87	Sasaki et al.	558	322	
	5,094,990	3/10/92	Sasaki et al.	502	214	
	5,132,269	7/21/92	Sasaki et al.	502	205	

## FOREIGN PATENT DOCUMENTS

Exmr Initial	Document Number	Date	Country	Class	Sub Class	Translation YES NO
	EP 661 254 A2/A3	7/5/95	EP	C07C	5/48	X
	WO 99/42404	8/26/99	PCT	C01G	51/00	X

## OTHER DOCUMENTS

(Including Author, Title, Date, Pertinent Pages, Etc.)

Examiner			Date Considered

**Examiner:** Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

FORM PTO-1449	U.S. DEPT. OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTY. DOCKET NO.	SERIAL NO. To Be Assigned
<b>Information Disclosure Statement by Applicant</b> (Use several sheets if necessary)		APPLICANT Yumin Liu	
		FILING DATE Even Date Herewith	GROUP To Be Assigned

### U.S. PATENT DOCUMENTS

Exmr Initial	Document Number	Date	Name	Class	Sub Class	Filing Date
	3,832,205	08/27/74	Lowery	106	288	
	4,176,140	11/27/79	Bertus et al.	585	629	
	4,250,346	02/10/81	Young et al.	585	658	
	4,296,607	10/27/81	Lawless	62	6	
	4,788,371	11/29/88	Imai et al.	585	443	
	4,940,826	07/10/90	Font Freide et al.	585	600	
	4,996,387	02/26/91	Gerhold et al.	585	654	
	5,219,816	06/15/93	Zhou et al.	502	223	
	5,376,613	12/27/94	Dellinger et al.	502	304	
	5,439,859	08/08/95	Durante et al.	502	66	
	5,593,935	01/14/97	Golunski et al.	502	339	
	5,723,707	03/03/98	Heyse et al.	585	444	
	5,733,518	03/31/98	Durante et al.	423	248	
	5,759,946	06/02/98	Hoang et al.	502	303	
	5,780,700	07/14/98	Hagemeyer et al.	585	617	

### FOREIGN PATENT DOCUMENTS

Exmr Initial	Document Number	Date	Country	Class	Sub Class	Translation YES NO
	0 544 372 A1	11/21/92	EP			
	0 573 713 A1	06/12/92	EP			
	WO 96/33149	10/24/96	PCT			

### OTHER DOCUMENTS

(Including Author, Title, Date, Pertinent Pages, Etc.)

		Zhang, Mingqian, et al., "Calcium-nickel-lithium oxide: A high selectivity catalyst for the oxidative dehydrogenation of ethane to ethylene," <i>J. Chem. Soc., Chem. Commun.</i> , pp. 1480-1481, 1993.
		Ducarme, V., et al., "Low temperature oxidative dehydrogenation of ethane over Ni-based catalysts," <i>Catalyst Letters</i> 23, pp. 97-101, 1994.
		López, R. Juárez, et al., "Oxidative dehydrogenation of ethane on supported vanadium-containing oxides," <i>Applied Catalysis A: General</i> 124, pp. 281-296, 1995.
		Ducarme, V., et al., "Low temperature oxidative dehydrogenation of ethane over new catalysts based on group VIII metals," presented before the Division of Petroleum Chemistry, Inc., 211th National Meeting, American Chemistry Society, New Orleans, Louisiana, March 24-29, 1996.
		Ji, Lang, et al., "Effect of group VIII elements on the behavior of Li/CaO catalyst in the oxidative dehydrogenation of ethane," <i>React. Kinet. Catal. Lett.</i> , Vol. 62, No. 1, 121-128, 1997.

			Schuurman, J. et al., "Low temperature oxidative dehydrogenation of ethane over catalysts based on group VIII metals," <i>Applied Catalysis: General</i> 163, pp. 227-235, 1997.
			Ducarme, J. et al., "Oxidative dehydrogenation of ethane of low temperature over nickel catalysts: Influence of morphology and chemical state of the solid during reaction," in <i>Natural Gas Conversion II: Studies in Surface Science and Catalysis, Vol. 107</i> , (Eds. M. de Pontes, R.L. Espinoza, J.H. Scholz and M.S. Scurrall), pp. 361-366, 1997.
			Barrault, J., et al., "Selective oxidation of propane into oxygenated compounds over promoted nickel-molybdenum catalysts," in <i>3rd World Congress on Oxidation Catalysis</i> , (Eds. R.K. Grasselli, S.T. Oyama, A.M. Gaffney and J.E. Lyons) pp. 375-382, 1997.
			Jalowicki-Duhamel, L., et al., "Oxidative dehydrogenation of propane on $CeNi_xO_y$ ( $0 \leq x \leq 1$ ) mixed oxides hydrogen acceptors," in <i>3rd World Congress on Oxidation Catalysis</i> , (Eds. R. K. Grasselli, S.T. Oyama, A.M Gaffney and J.E. Lyons), pp. 383-392, 1997.

Examiner	Date Considered
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